

REMARKS

Claims 1-36 are all the claims pending in the application, of which claims 1, 5, 6, 10, 11, 17 - 22 and 25 - 32 are presently withdrawn from consideration.

Claims 2, 3, 7 - 9 and 12 - 14 have been rejected under 35 U.S.C. § 112 as being indefinite, with the Examiner citing an antecedency error in claim 2. Applicant has corrected the claim language via the Amendment above and requests withdrawal of the rejection.

Claims 2 - 4, 7 - 9, 12 - 16, 23, 24 and 33 - 36 have been rejected under 35 U.S.C. § 102 as being anticipated by Richardson 2003/0156605. Applicants respectfully traverse.

One key aspect of the invention resides in the development of fiber laser amplifier systems into “general purpose” ultrafast pulse sources for pulse energies in the submicrojoule to millijoule range. The invention provides for all fiber based chirped pulse amplification laser system that is suitable for industrial applications; an important element of which is the capability of modularizing the component parts of such systems to permit the building of such systems, and the replacement of parts thereof, in the field. Up to the present point in time, ultrafast pulse sources of significant power have largely been creatures of the laboratory, requiring highly skilled experts to build, operate, align and maintain them. The invention represents a major advance toward ultrafast systems which are sufficiently robust, reliable and easily operable to permit their widespread use in industrial settings.

Applicants appreciate the Examiner’s observation of similarities between the function of the present laser system and that in Richardson. The Examiner however fails to recognize the differences between the laser in this published patent application and that as claimed. The fiber

laser system in Richardson, as well as that of Applicant's own referenced prior art which Richardson largely adopts, are research tools fixed to optical tables which have been carefully assembled and aligned by PhDs and graduate students. The examiner fails to appreciate that the system disclosed in the present application can be produced in quantity and simply assembled using common fiber splicing techniques, from modules that can be separately assembled and tested.

The Examiner is incorrect in stating that Richardson discloses modules. There is no mention of modules, or the separate assembly and testing of any of the elements in his set-up, or any means of putting such modules together, or of using tap units for monitoring the performance of the modules, all of which is described in detail in claim 15 (and to a greater or lesser extent in other independent claims).

With respect to claims 24, 35 and 36 in particular, the Examiner also fails to note the absence of any polarization control in the reference as well. Polarization control is a necessary component in laser manufacturability. The lack thereof leads to high frequency noise due to polarization interference as is pointed out in Fig. 10c, which in turn leads to the long pulse noise as shown in figure 10b.

With respect to claims 16, 33, and 34. The following statement by the examiner is not correct:

“The diffractive nature of the AOMS result in the AOMs acting as a bandwidth filter, this very nature results in spatial dispersion, and the

compressor 146 effectively compensates by compressing for this spatial dispersion.”

The diffractive nature of the AOM results in spatial dispersion. However, after the AOM is a single mode fiber. The spatial dispersion is either corrected by a lens or the spectrum is cut as the light is input into the single mode fiber. The spatial dispersion does not continue in the fiber, and compressor 146 can not correct for spatial dispersion (CPA compressors correct for temporal, not spatial, dispersion). An AOM by its diffractive nature does not necessarily result in the AOM acting as a bandwidth filter. There needs to be a spatial limiting element. It is the same with the diffractive nature of the compressor gratings. There is not necessarily a bandwidth narrowing in the compressor. The spectral width in the Richardson laser is greater than that disclosed here. Applicants note that there is no indication or mention of spectral narrowing from the AOMs.

With respect to claim 23, Richardson does not disclose an isolator between the oscillator 10 and first amplifier 68a. Richardson does not disclose an isolator in the signal path with an isolation of 35 db. Paragraph 179 of Richardson is discussing an isolator between the amplifier and the pump diode.

With respect to claims 2, 3, 7-9 and 12-14, Applicants fail to understand the comments about the down converter 52 being an attenuator. These claims do not mention an attenuator.

Finally, with respect to the Examiner’s comments concerning claim interpretation, Applicants believe the Examiner’s interpretation strained. Nevertheless, amendments have been made to positively claim a non-zero number of tap units, as the Examiner will note.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

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CUSTOMER NUMBER

/Richard Turner/
Richard C. Turner
Registration No. 29,710

Date: October 19, 2006